

Mirror Measurement Device



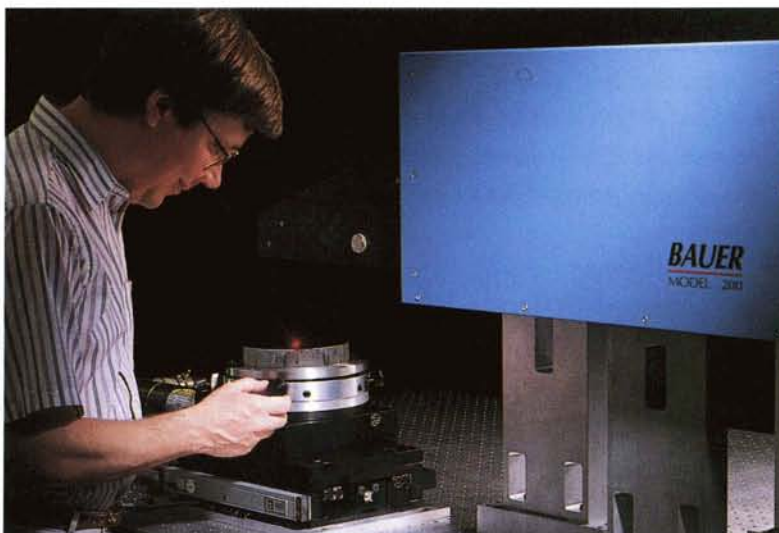
Below, president Paul Glenn of Bauer Associates, Inc., Wellesley, Massachusetts is adjusting a Bauer Model 200 Profilometer, an instrument that measures the shape profile of mirror surfaces used in astronomical telescopes and other scientific instruments. The Model 200 is based on a new measurement concept conceived by Bauer Associates and developed under NASA Small Business Innovation Research (SBIR) contracts funded by Goddard Space Flight Center.

Virtually all earlier profilometers are based on the principle of interferometry wherein the path length of a light beam reflected by the surface being measured is compared with the path length of some other light beam. The Model 200 works on an entirely different approach: the local curvature of the mirror's surface (the exact degree to which it is convex or concave) is measured at many points and the collection of curvature data is computer-processed to yield the desired shape profile (**above**). This basic approach to curvature measurement was the "useful innovation" that inspired the SBIR contracts.



Bauer Associates was awarded a six-month Phase I study to evaluate the feasibility of the concept, then a two-year Phase II project to build and test a prototype instrument. The prototype's exceptional performance prompted Bauer to commercialize the instrument. The company is now marketing the Model 200 for full service measurements and the Model 100 for single line measurements. The system, says president Glenn, "gives unprecedented accuracy as well as immunity to common problems with the measurement environment, such as vibration and turbulence."

Bauer Associates used the technology again as the foundation for another new profilometer, the Model 400, which meas-



ures the entire surface shape profile of large aspheric mirrors, accommodating both polished and unpolished surfaces. This concept similarly won Phase I/II SBIR contracts funded by Goddard. The Phase II effort was successfully completed in 1992 and commercialization is expected soon. ●